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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/582,548	06/09/2006	Minoru Sugiyama	3163-061714	4734

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THE WEBB LAW FIRM, P.C.
ONE GATEWAY CENTER
420 FT. DUQUESNE BLVD, SUITE 1200
PITTSBURGH, PA 15222

EXAMINER	
MARKS, JACOB B	

ART UNIT	PAPER NUMBER
1729	

NOTIFICATION DATE	DELIVERY MODE
06/09/2011	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patents@webblaw.com

Office Action Summary	Application No.	Applicant(s)	
	10/582,548	SUGIYAMA ET AL.	
	Examiner	Art Unit	
	Jacob Marks	1729	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03-21-2011*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-7 and 17* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-7 and 17* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claims 1-7 and 17 are pending. Claims 8-16 are cancelled. Claim 1 was amended.

All previous claim rejections are withdrawn in light of applicant's persuasive arguments.

The text of those sections of 35 U.S. Code not included in this action can be found in the previous Office Action dated 03-21-2011.

Claim Rejections - 35 USC § 103

Claims 1-7 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Munshi (US Pat. Pub. 2003/0026063) in view of "Skotheim et al. (US Pat. No. 6,797,42328 and as evidenced by "In situ SEM study of the interfaces in plastic lithium cell," Journal of Power Sources Vol. 81-82, Sept. 1999, pgs. 918-921, F. Orsini et al. (hereinafter Orsini et al.).

Regarding claims 1-3, Munshi discloses an electrochemical capacitor comprising: a thin polymer film with electrolyte absorbed therein (polymer electrolyte), an anode and a cathode (abstract). Electrodes of electrochemical capacitors are inherently polarizable. Munshi discloses an anode (16 and 20) comprising a metal layer 16 and an active material layer 20 that are formed on the electrolyte 70 (par. 84, fig. 2). Munshi discloses that the anode active material 20 and the cathode active material 60 sandwich the electrolyte 70 (fig. 2, par. 84). Munshi discloses that the electrolyte may be composed of a lithium salt (par. 34). Munshi further teaches that active materials based

on lithium battery active materials have the advantage of allowing prolonged discharge times and increased capacity (par. 79). Munshi discloses the use of transition metal oxides as the active material (79). A capacitor with a transition metal oxide active material and lithium salt electrolyte would inherently be capable of releasing lithium ions through a reversible electrochemical oxidation-reduction reaction.

Munshi does not disclose that the specific capacity of the capacitor is 20 F/cm^3. However, Munshi disclose that conventional capacitors have capacitances of up to 2.8 F/cm^2(par. 8). Munshi further disclose that it is favorable and important to increase the capacity of capacitors (par. 12). Thus, the capacity of a capacitor is a known result effective variable. The optimization of a known result effective variable can be characterized as routine experimentation. See, *In re Boesch*, 617 F.2d 272 (CCPA 1980). Therefore, it would have been obvious to one of ordinary skill in the art to optimize the capacity of the capacitor of Munshi because the capacitance is a known result effective variable.

Munshi does not disclose that a lithium-metal alloy, or more specifically a lithium-gold alloy can be used as part of the active material. However, Skotheim et al. disclose an anode active material for a lithium ion battery comprising lithium and a lithium metal alloy, wherein the lithium may be alloyed with gold (abstract, col. 16 lines 24-45). Therefore, it would have been obvious to one of ordinary skill in the art to use the active material containing a gold-lithium alloy, as taught by Skotheim et al., in the capacitor of Munshi, because Munshi discloses that active materials based on lithium battery active materials have prolonged discharge times and increased capacity.

The combination of Munshi and Skotheim et al. does not specifically disclose that lithium electrode (metal component) is contained in the polymer electrolyte, that the outer electrolyte is rich in lithium electrode material (metal) or that the electrolyte center is rich in electrolyte. However, Orsini et al. discloses that during normal charge and discharge of lithium anodes that lithium forms dendrites that can pierce the electrolyte components (pgs. 919-920, fig. 4 and 5). Therefore, the combination of Munshi and Skotheim would inherently form dendrites of lithium (metal component) in the polymer electrolyte during normal use of the capacitor. Such lithium dendrites would cause the lithium (metal component) to be rich in the outer regions of the electrolyte and would cause the electrolyte to be rich in the center. Therefore it would have been obvious to one of ordinary skill in the art to form a rich metal region in the outer area of the electrolyte and a rich electrolyte region in the center of the electrolyte of the Munshi and Skotheim combination because Orsini et al. disclose that lithium dendrites can form during the normal charging and discharging of lithium electrodes.

The combination of Munshi and Skotheim et al. does not specifically disclose that lithium electrode forms a projecting part in a boundary region of the polymer electrolyte in the shape of an icicle. However, Orsini et al. discloses that during normal charge and discharge of lithium anodes, lithium forms dendrites that can pierce the electrolyte components (pgs. 919-920, fig. 4 and 5). Therefore, the combination of Munshi and Skotheim would inherently form dendrites of lithium (metal component) in the polymer electrolyte during normal use of the capacitor. Such lithium dendrites would be in the shape of an icicle (fig. 5). Therefore it would have been obvious to one of ordinary skill

in the art to form the electrode with a projecting part in the shape of an icicle in the combination of the Munshi and Skotheim because Orsini et al. disclose that lithium dendrites can form during the normal charging and discharging of lithium electrodes.

Regarding claim 4, Munshi discloses that the cathode and the anode should consist of similar materials. Therefore, the combination of Munshi and Skotheim would inherently have the same gold-lithium anode and cathode as discussed with respect to claim 1.

Regarding claim 5, Munshi discloses that the electrolyte may be composed of a lithium salt (par. 34). Munshi further teaches that active materials based on lithium battery active materials have the advantage of allowing prolonged discharge times and increased capacity (par. 79). Munshi discloses the use of transition metal oxides as the active material (79). A capacitor with a transition metal oxide active material and lithium salt electrolyte would inherently have lithium deposited on the electrode during charging and discharging. The combination of Munshi and Skotheim et al. would inherently have the lithium alloy form on the lithium gold alloy component of the active material.

Regarding claim 6, Munshi discloses that the polymer electrolyte may be Nafion or poly(bis(methoxy-ethoxy-ethoxide))-phos- phazene (MEEP), which are ion exchange resins (par. 33).

Regarding claim 7, Munshi disclose an anode, a cathode and an electrolyte (electrode assembly) (abstract).

Regarding claim 17, the combination of Munshi and Skotheim et al. does not specifically disclose the formation of a projecting part in a boundary region of the

polymer electrolyte that is in the shape of a substantially cyclical curve. However, Orsini et al. discloses that during normal charge and discharge of lithium anodes, lithium can form a dendrite moss that can pierce the electrolyte components wherein the dendrite moss has a borderline that is a substantially cyclical curve (pgs. 919-920, fig. 4 and 5). Therefore, the combination of Munshi and Skotheim would inherently form a dendrite moss of lithium (metal component) that is in the shape of a substantially cyclical curve in the polymer electrolyte during normal use of the capacitor.

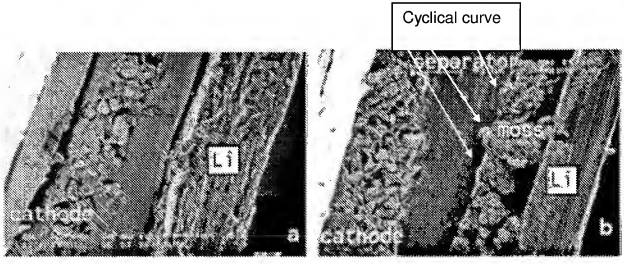

Fig. 4. Lithium battery section after 1 charge (a) and 14 charges (b) ($C/5$, 0.45 mA/cm^2).

Response to Arguments

Applicant's arguments filed 03-21-2011 have been fully considered but they are only persuasive in part. Applicant's argument that the Munshi combination would not inherently produce a capacitor with a capacitance of 20 F/cm^3 or more is moot in view of new grounds of rejection as discussed above.

Applicant argues that the combination of Munshi and Skotheim would not have the negative electrode comprising a lithium alloy in contact with the electrolyte because Skotheim teaches that there are other intervening layers. However, Skotheim is not offered as teaching that the active material is in contact with the electrolyte. Rather, Munshi is offered as teaching that the active material is contact with the electrolyte and Skotheim is offered as teaching that the active material may be an alloy of lithium.

Applicant argues that the combination of Munshi, Skotheim, and Orsini does not teach that the negative electrode is formed in the polymer electrolyte and that a metal component is rich in a vicinity of an outer side of the polymer electrolyte and not rich in the center of the polymer electrolyte. However, Orsini teaches that anode active material will pierce a polymer electrolyte, making the metal active material rich near the surface of the polymer and not rich in the center.

Applicant argues that the Orsini article discloses that the anode active material is formed by the charging and discharging of the battery and not by applicant's method. However, applicant claims a product. The patentability of a product lies in the structure, not the method of manufacturing. It is the position of the examiner that the structure of

a negative electrode would inherently form the structure claimed as evidenced by Orsini.

Applicant argues that Orsini does not teach an electrolyte sandwiched between a cathode and anode. However, Orsini is not offered as teaching such a configuration. In addition, a capacitor must inherently have a cathode and anode sandwich an electrolyte in order to function.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jacob Marks whose telephone number is (571)270-7873. The examiner can normally be reached on Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ula Ruddock can be reached on 571-272-1481. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a

USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jacob Marks/

/ULA C. RUDDOCK/
Supervisory Patent Examiner, Art Unit 1729